

# Important Advances in Clinical Medicine

## *Epitomes of Progress — Allergy*

*The Scientific Board of the California Medical Association presents the following inventory of items of progress in allergy. Each item, in the judgment of a panel of knowledgeable physicians, has recently become reasonably firmly established, both as to scientific fact and important clinical significance. The items are presented in simple epitome and an authoritative reference, both to the item itself and to the subject as a whole, is generally given for those who may be unfamiliar with a particular item. The purpose is to assist the busy practitioner, student, research worker or scholar to stay abreast of these items of progress in allergy which have recently achieved a substantial degree of authoritative acceptance, whether in his own field of special interest or another.*

*The items of progress listed below were selected by the Advisory Panel to the Section on Allergy of the California Medical Association and the summaries were prepared under its direction.*

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### **Pulmonary Function in Asymptomatic Patients With Asthma**

ABNORMALITIES in spirometric and lung volume measurements have been shown to occur in asthmatic patients during symptom free intervals. However, these measures may be within normal limits and still abnormalities may be found in measurement of small airways as well as in ventilation perfusion.

In patients completely asymptomatic by all clinical criteria, there may be decreased peak expiratory flow rate, decreased one second forced expiratory volume and decreased ratio of one second forced expiratory volume to vital capacity. Even when results of these tests have returned to normal along with airway resistance and specific airway conductance, measurements of residual volume, functional residual capacity, and the ratio of residual volume to total lung capacity may remain abnormally large.

Local areas of small airway dysfunction may continue to be present in asymptomatic patients, causing early closure of these airways. This is reflected in frequency dependence of compliance, an increased slope of the alveolar plateau and high closing volumes measured by the single

breath gas dilution technique. Closing volumes may, in fact, be greater than functional residual capacity so that airway closure occurs during tidal ventilation.

Overall hyperventilation is known to occur in asthmatic patients with local areas of hypoventilation and hypoperfusion. The ventilation defects, however, have been shown to be of greater severity than the perfusion defects, resulting in ventilation perfusion mismatching. Ventilation perfusion defects with generalized hyperventilation may cause hypoxemia, hypocarbia, increased alveolar-arterial oxygen difference and an increased ratio of dead space volume to tidal volume.

Therefore, even when an asthmatic patient is asymptomatic by clinical criteria, significant pulmonary dysfunction often exists. It is this knowledge that necessitates close supervision and periodic monitoring by pulmonary function testing in patients with asthma.

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#### **REFERENCES**

- McCarthy D, Milic-Emili J: Closing volume in asymptomatic asthma. *Am Rev Resp Dis* 107:559-570, Apr 1973  
McFadden ER Jr, Riser R, DeGroot WJ: Acute bronchial asthma: Relations between clinical and physiological manifestations. *N Engl J Med* 288:221-225, Feb 1 1973  
Wilson AF, Surprenant EL, Beall GN, et al: The significance of regional pulmonary function changes in bronchial asthma. *Amer J Med* 48:416-423, Apr 1970